

TC-RX50 / RX50ES

SERVICE MANUAL

US Model
TC-RX50ES

AEP Model

UK Model
TC-RX50



Photo : TC-RX50ES

SPECIFICATIONS

Recording system
4-track 2-channel stereo

Fast-forward and rewind time
Approx. 90 sec. (with C-60 cassette)

Bias
AC Bias

Signal-to-noise ratio (NAB, at peak level)

	DOLBY NR switch	OFF	B-TYPE ON	C-TYPE ON
Cassette				
TYPE IV (Sony METAL-ES)		58 dB	65 dB	71 dB
TYPE II (Sony UX-S)		57 dB	64 dB	70 dB
TYPE I (Sony HF-S)		54 dB	61 dB	67 dB

Total harmonic distortion
1.0 % (with Sony METAL-ES cassettes)

Frequency response
DOLBY NR OFF

- With TYPE IV cassette (Sony METAL-ES)
20–20,000 Hz (±3 dB)
30–15,000 Hz (±3 dB, OVU recording)
- With TYPE II cassette (Sony UX-S)
30–17,000 Hz (±3 dB)
- With TYPE I cassette (Sony HF-S)
30–15,000 Hz (±3 dB)

Wow and flutter
0.09% WRMS (NAB)

Inputs
Microphone inputs (phone jacks)
Sensitivity 0.25 mV (–70dB)
For a low-impedance microphone

Line inputs (phono jacks)
Sensitivity 77.5 mV (–20 dB)
Input impedance 50 kilohms

Outputs
Line outputs (phono jacks)
Output level 0.44 V (–5 dB) at load
impedance 47 kilohms
Load impedance over 10 kilohms

Headphones output (stereo phone jack)
Output level –28 dB at load impedance
8 ohms

Model Name Using Similar Mechanism	TC-RX400
Tape Transport Mechanism Type	TCM-170RB2

General

Power requirements

US model : 120 V AC, 60 Hz
AEP model : 220 V AC, 50/60 Hz
UK model : 240 V AC, 50/60 Hz

Power consumption

15 W

Dimensions

Approx. 430 × 118 × 255 mm (w/h/d)
(17 × 4³/₄ × 10¹/₈ inches)

Weight

including projecting parts and controls
Approx. 3.8 kg (8 lbs 7 oz)

Supplied accessories

Connecting cord (2)
Remote control cord (1)



STEREO CASSETTE DECK
SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

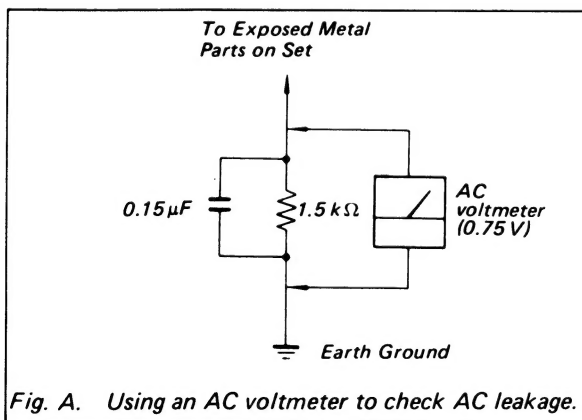

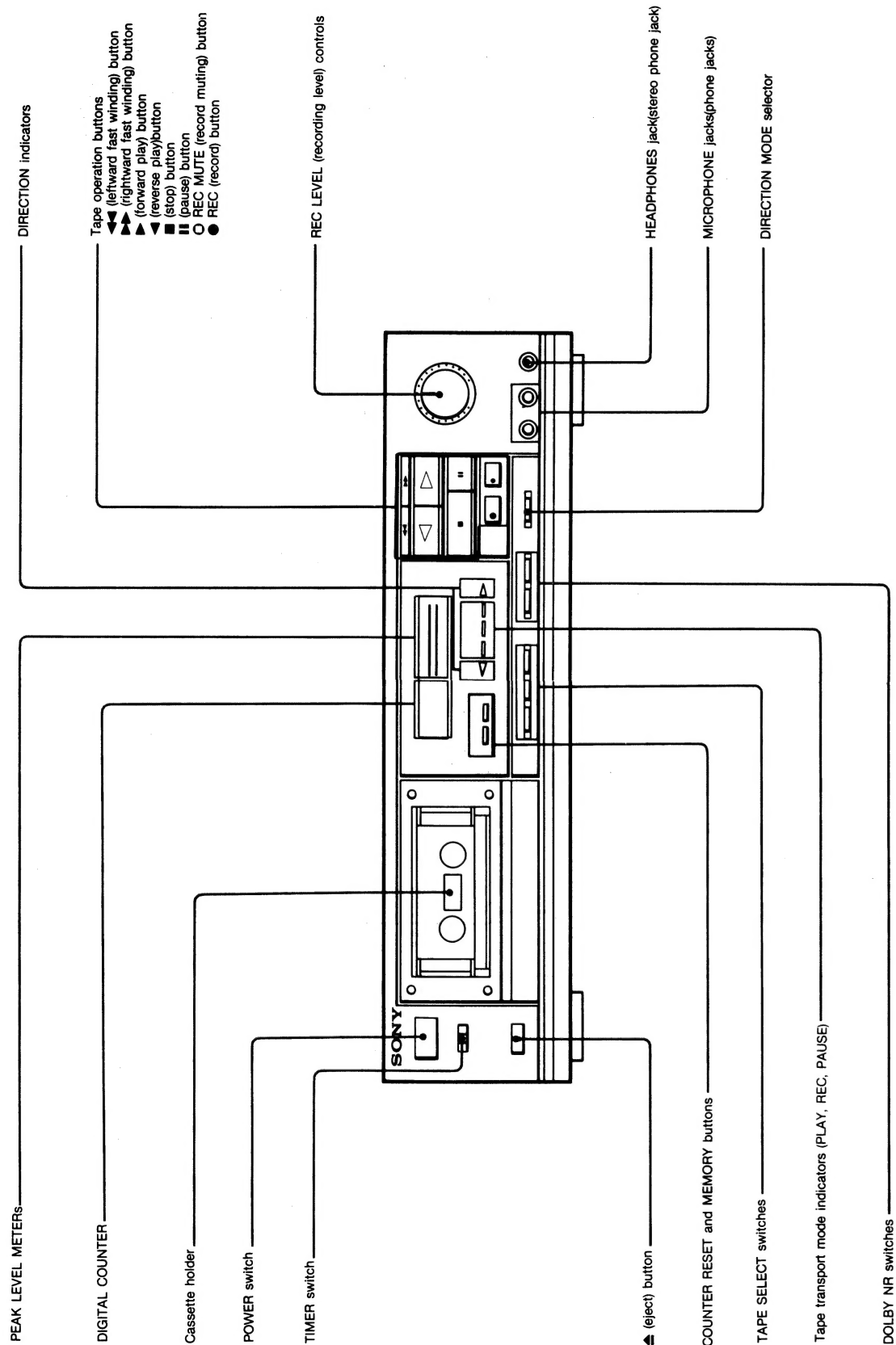


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SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
GENERALSECTION 2
MECHANICAL ADJUSTMENTS

PRECAUTION

- Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers
- Demagnetize the record/playback head with a head demagnetizer.
- Do not use a magnetized screwdriver for the adjustments.
- After the adjustments, apply suitable locking compound to the parts adjusted.
- The adjustments should be performed with the rated power supply voltage unless otherwise noted.

2-1. TORQUE MEASUREMENT

Mode	Torque Meter	Torque
FWD	CQ-102C	30-70g·cm 0.41-0.97oz·inch
FWD back tension	CQ-102C	2-6g·cm 0.03-0.08oz·inch
REV	CQ-102RB	30-70g·cm 0.41-0.97oz·inch
REV back tension	CQ-102RB	2-6g·cm 0.03-0.08oz·inch
FF,REW	CQ-201B	90-160g·cm 1.25-2.22oz·inch

SECTION 3
ELECTRICAL ADJUSTMENTS

Note: The adjustment should be performed in the order given in this service manual.

The adjustments should be performed for both L-CH and R-CH.

- Set the TAPE switches according to the tape as follows.

Tape	Tape Switch
CS-17	TYPE I
CS-26	TYPE II
CS-42	TYPE IV

- Switches and controls should be set as follows unless otherwise specified.

DOLBY NR switch: OFF

- Standard Record:

Deliver the standard input signal level to the input jack and set the REC LEVEL control to obtain the standard output signal level.

Standard Input Level

INPUT Terminal	LINE IN
source impedance	10k Ω
input level	0.25V (-10dB)

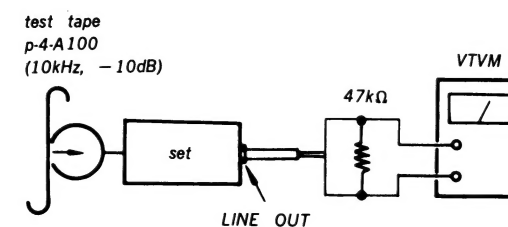
Standard Output Level

OUTPUT Terminal	LINE OUT
load impedance	47k Ω
output level	0.453V (-5dB)

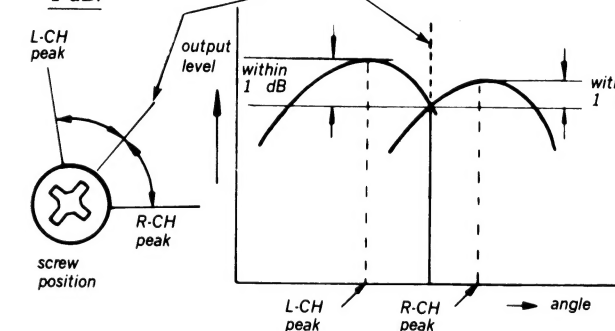
3-1. RECORD/PLAYBACK HEAD AZIMUTH ADJUSTMENT

Procedure:

- Mode: playback

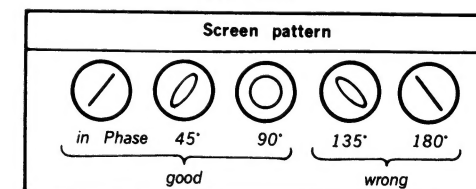
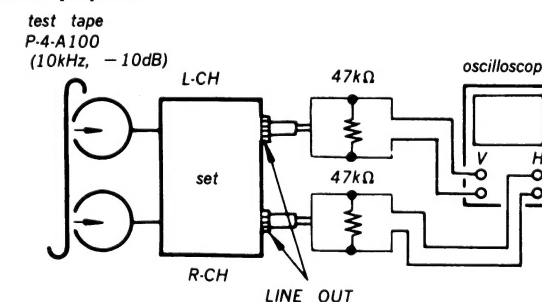


- Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1 dB.



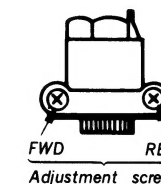
- Phase Check

Mode: playback



- Repeat steps 1-3 in REV playback mode.
- After the adjustment, lock the screws with locking compound.

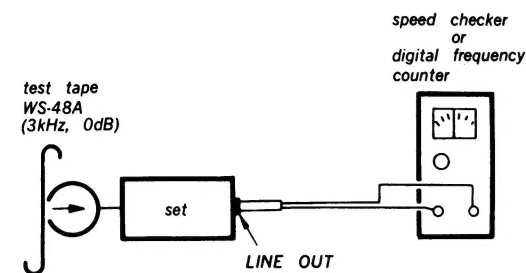
Adjustment Location:



3-2. SPEED ADJUSTMENT

Procedure :

Mode : playback

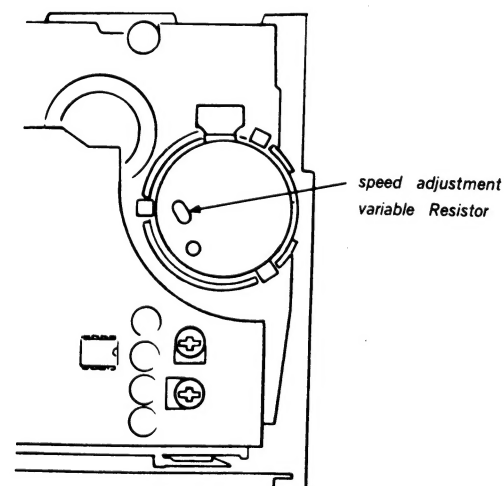


Specification :

Speed checker	Digital frequency counter
-1 - +1%	2,950 - 3010Hz

Frequency difference between the beginning and the end of the tape should be within 1.5% (45Hz).

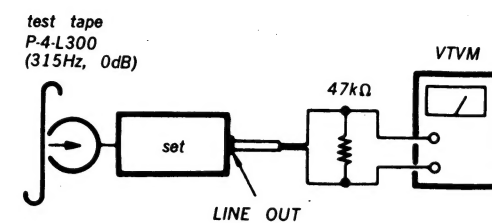
Adjustment Location :



3-3. PLAYBACK LEVEL ADJUSTMENT

Procedure :

Mode: Playback



Adjust RV41 (L-CH) and RV61 (R-CH)

Specification :

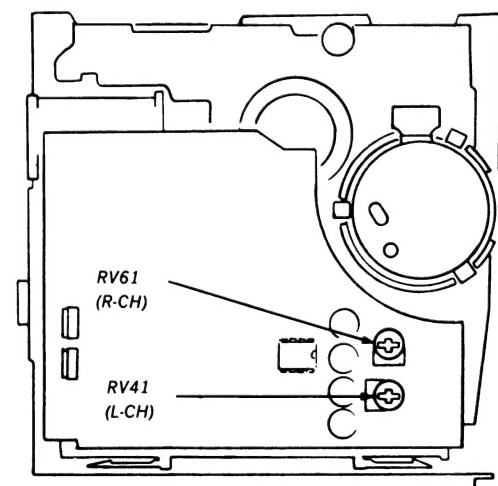
LINE OUT level: 0.39 to 0.49
(-6 to -4dB)

Level difference between channels:
less than 0.5dB(0.05V)

Check that the LINE OUT level does not change in playback mode while chaging the mode from playback to stop several times.

Adjustment Location :

—MD board—



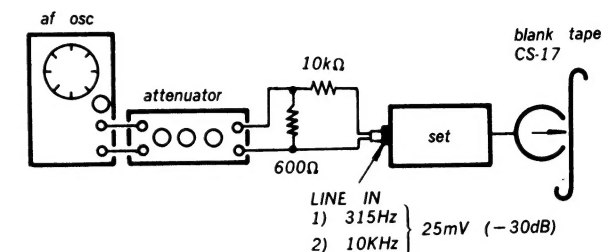
3-4. RECORD BIAS ADJUSTMENT

Setting :

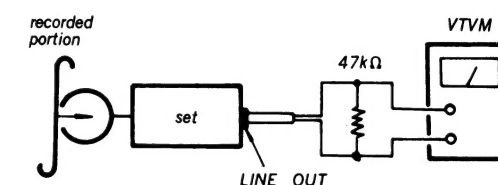
REC LEVEL control: standard record
(See page 4)

Procedure :

1. Mode: record

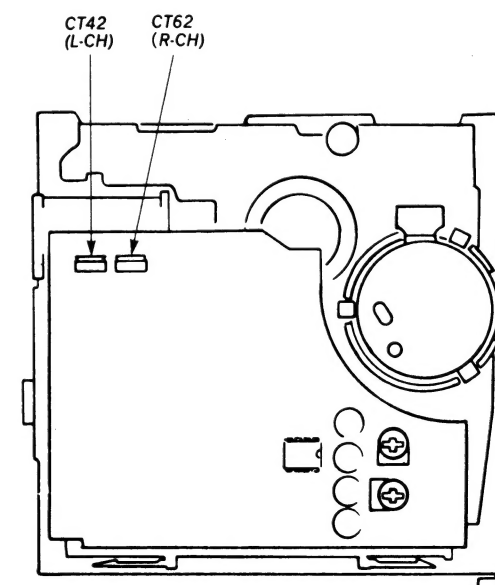


2. Mode: playback



Adjust CT42 (L-CH) and CT62 (R-CH) so that the LINE OUT level of 10kHz signal is 0dB±0.5dB relative to that of 315Hz.

Adjustment Location :



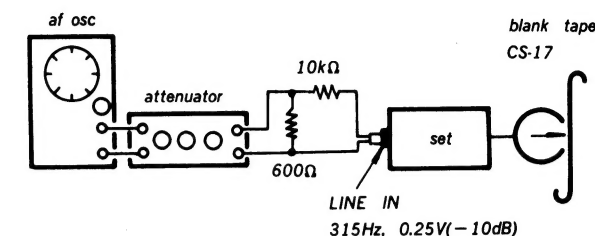
3-5. RECORD LEVEL ADJUSTMENT

Setting :

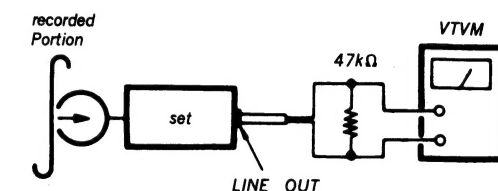
REC LEVEL control: standard record
(See page 4)

Procedure :

1. Mode: record



2. Mode: playback



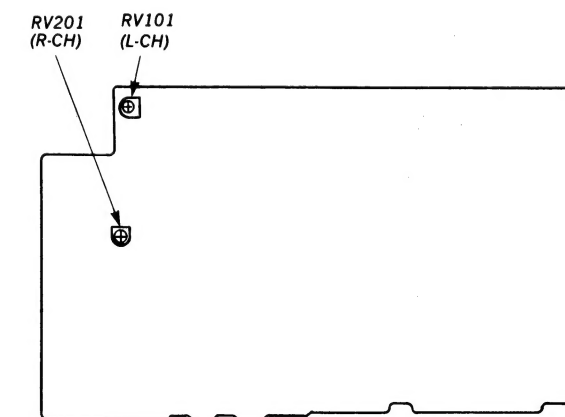
Adjust RV101 (L-CH) and RV201 (R-CH)

Specification :

LINE OUT level: 0.41 to 0.46V
(-5.5 to -4.5dB)

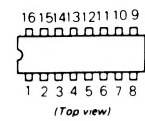
Adjustment Location :

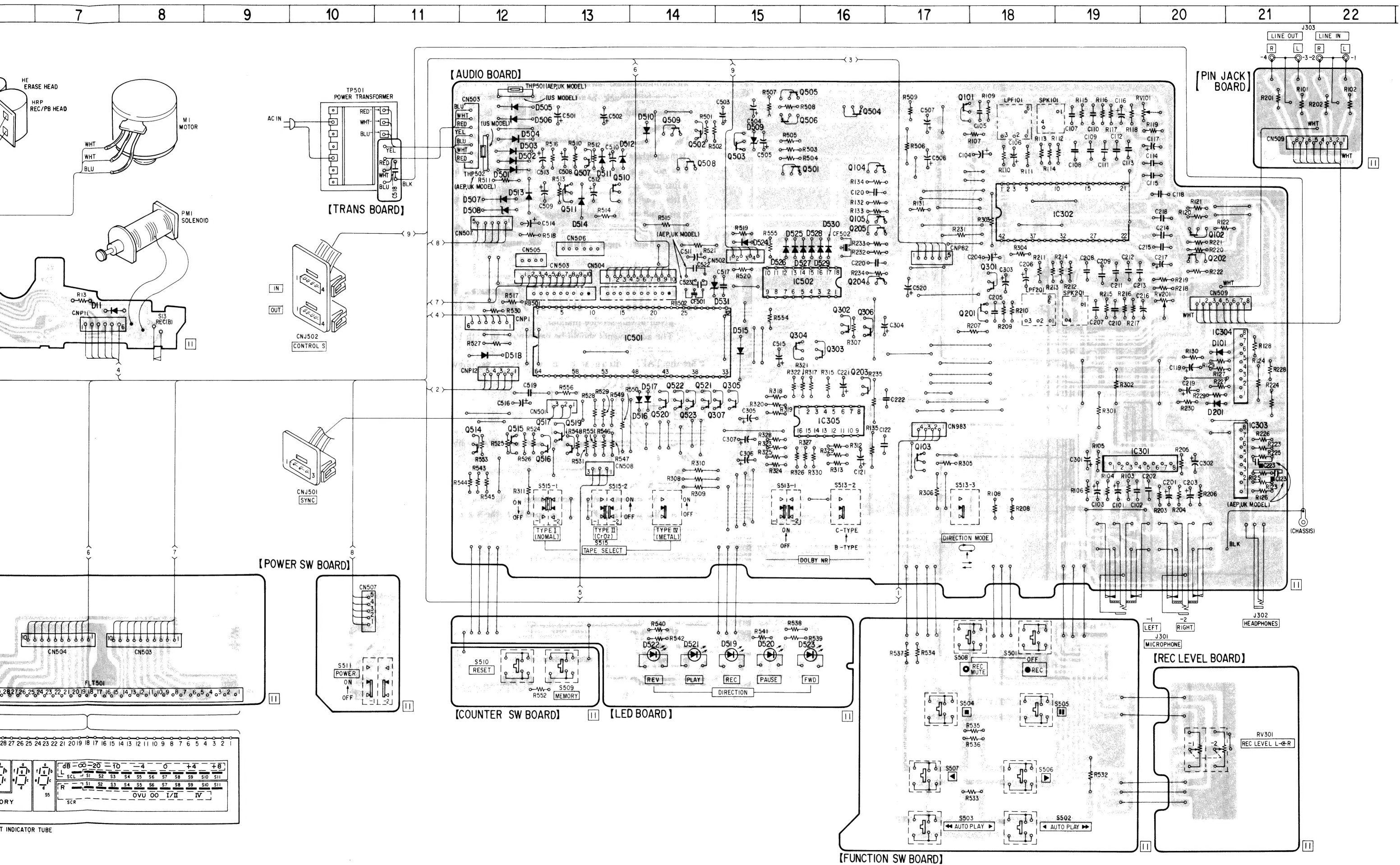
—audio board—



SECTION 4 DIAGRAMS

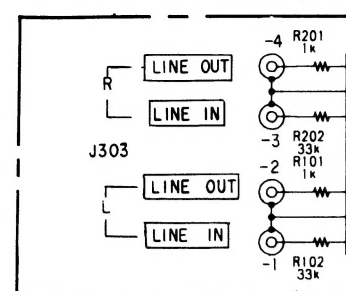
● Semiconductor Lead Layouts





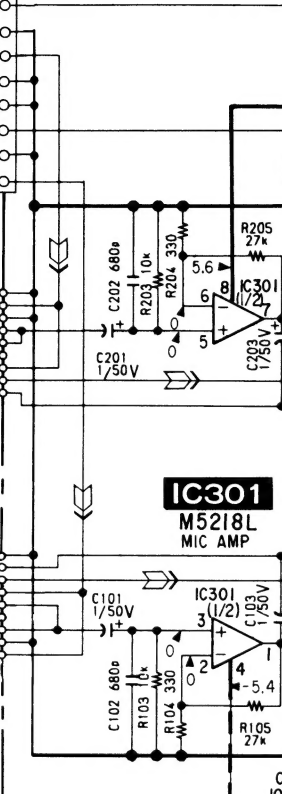
4-2. SCHEMATIC DIAGRAM

[PIN JACK BOARD]



[AUDIO BOARD]

Q301 DTC114ES REC/PB SWITCH
Q201 2SC2785 MPX FILTER
IC302 CX20187 DOLBY NR



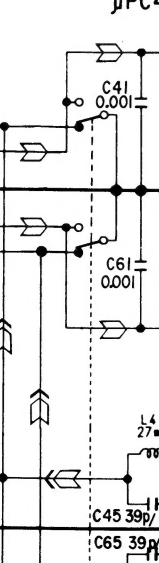
[REC LEVEL BOARD]

IC301 M5218L MIC AMP
RV301 REC LEVEL L-R



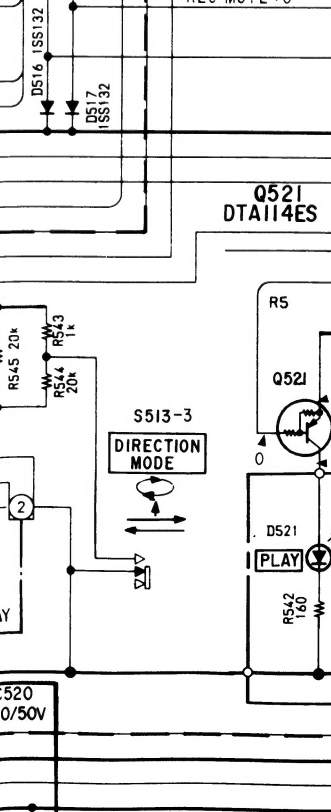
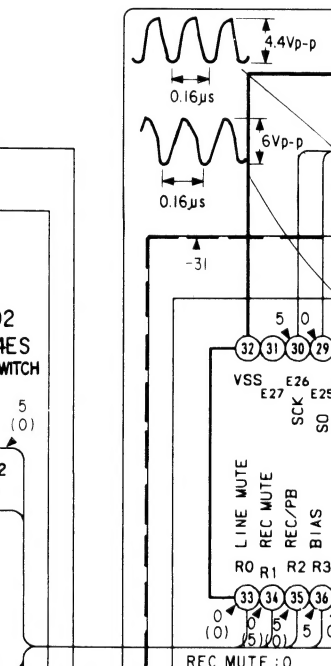
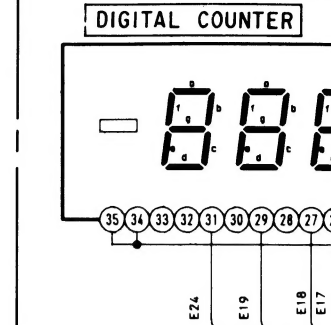
[MD BOARD]

IC81 μ PC4570C-1
Q105 Q104 DTC114ES DTC114ES 120/70 μ SWITCH CUE MUTE



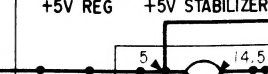
[FL METER BOARD]

FLT501 FLUORESCENT INDICATOR TUBE
DIGITAL COUNTER



[TIMER BOARD]

Q509 2SC2785 +5V REG
Q508 2SD1585 +5V STABILIZER

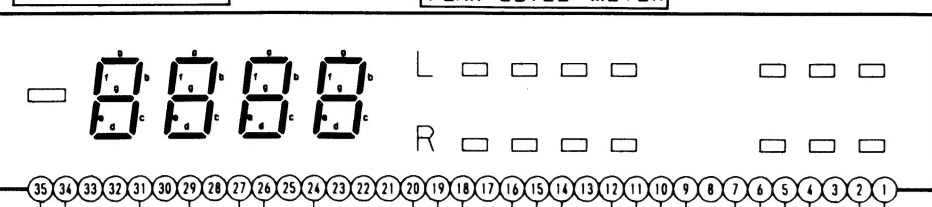


【FL METER BOARD】

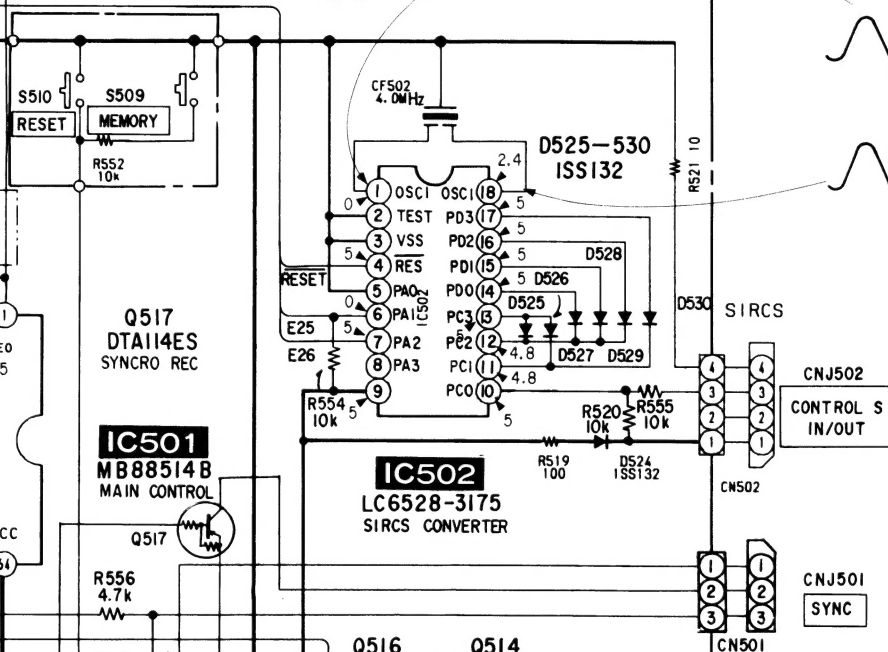
FLT501 FLUORESCENT INDICATOR TUBE

DIGITAL COUNTER

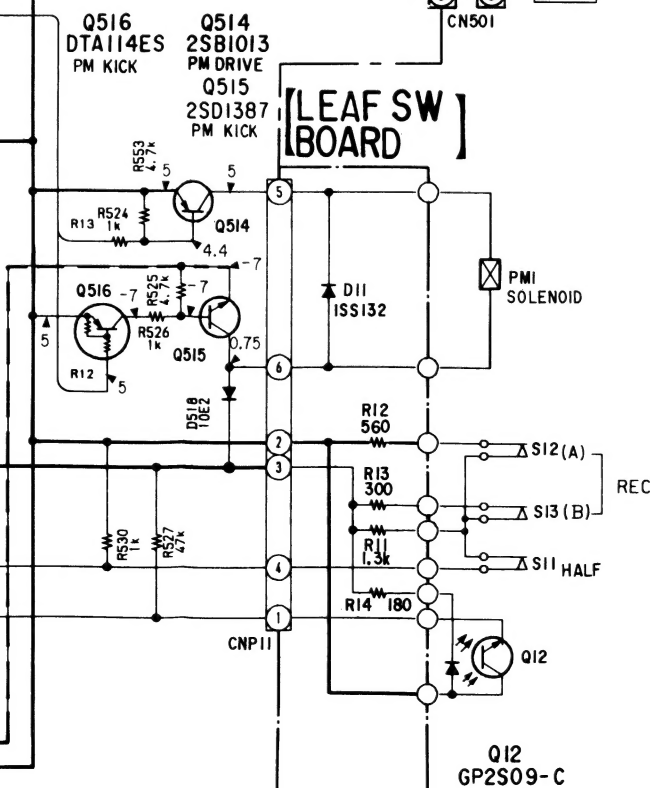
PEAK LEVEL METER



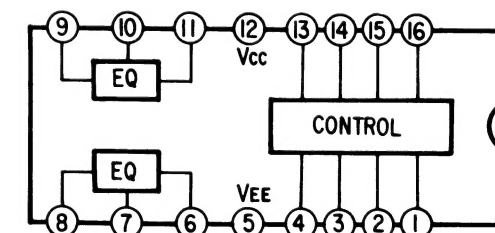
【COUNTER SW BOARD】



【LEAF SW BOARD】



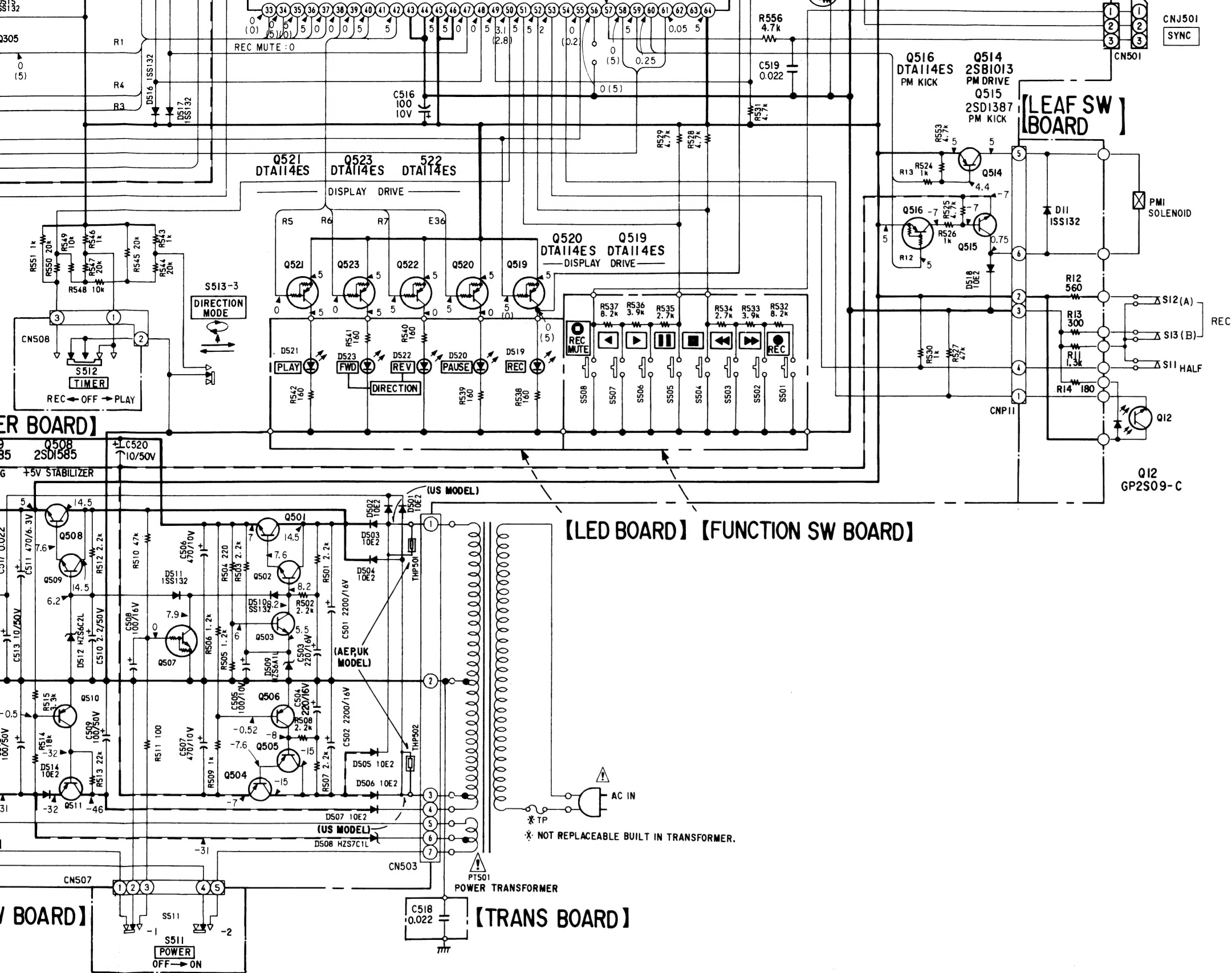
IC305 CXA1198P



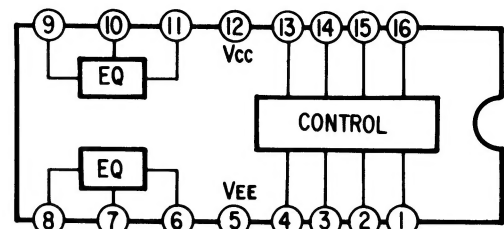
Note:

- All capacitors are in μF unless otherwise noted. pF: μM F 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- % : indicates tolerance.
- \square : fusible resistor.
- Switch

Ref. No.	Switch	Position
S10	DIRECTION	OFF
S11	HALF	OFF
S12	REC(A)	OFF
S13	REC(B)	OFF



IC305 CXA1198P



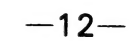
Note:

- All capacitors are in μF unless otherwise noted. pF: μF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}W$ or less unless otherwise specified.
- % : indicates tolerance.
- : fusible resistor.
- Switch

Ref. No.	Switch	Position
S10	DIRECTION	OFF
S11	HALF	OFF
S12	REC(A)	OFF
S13	REC(B)	OFF
S501	●	OFF
S502	▶▶	OFF
S503	◀◀	OFF
S504	■	OFF
S505		OFF
S506	▶	OFF
S507	◀	OFF
S508	●	OFF
S509	MEMORY	OFF
S510	RESET	OFF
S511	POWER	OFF
S512	TIMER	OFF
S513	DOLBY NR/ DIRECTION MODE	OFF/≠
S515	TAPE SELECT	TYPE I

- : B+ Line
- : B- Line
- : adjustment for repair.
- AC voltage readings in the bias oscillator with a VTVM.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- no mark : PLAY
- () : REC
- Voltages are taken with a VOM (50 k Ω/V). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- : PB
- : REC

Note: The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.



SECTION 6 ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:MF: μ F, PF: μ F.**RESISTORS**

- All resistors are in ohms.
- F: nonflammable

COILS

- MMH: mH, UH: μ H

SEMICONDUCTORSIn each case, U: μ , for example:UA....: μ A...., UPA....: μ PA....,UPC....: μ PC, UPD....: μ PD...



The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
901	*A-2095-637-A	(US)....MOUNTED, PCB, AUDIO		C202	1-162-292-31	CERAMIC	680PF 10% 50V
901	*A-2095-642-A	(AEP, UK)....MOUNTED, PCB, AUDIO		C203	1-124-499-11	ELECT	1MF 20% 50V
902	1-551-506-XX	(US)....CORD, POWER		C204	1-123-875-11	ELECT	10MF 20% 50V
902	1-555-795-00	(AEP)....CORD, POWER		C205	1-161-375-00	CERAMIC	0.0022MF 30% 16V
902	1-556-035-00	(UK)....CORD, POWER		C206	1-123-875-11	ELECT	10MF 20% 50V
903	*1-624-148-11	PC BOARD, LEAF SW		C207	1-130-479-00	MYLAR	0.0047MF 5% 50V
904	*A-2010-263-A	MOUNTED PCB, MD (B)		C208	1-136-173-00	FILM	0.47MF 5% 50V
905	A-2108-124-A	PC BOARD ASSY, HEAD (HRP/HE)		C209	1-136-167-00	FILM	0.15MF 5% 50V
CAPACITOR				C210	1-136-155-00	FILM	0.015MF 5% 50V
C41	1-130-471-00	MYLAR	0.001MF 5% 50V	C211	1-136-169-00	FILM	0.22MF 5% 50V
C42	1-136-157-00	FILM	0.022MF 5% 50V	C212	1-136-163-00	FILM	0.068MF 5% 50V
C43	1-124-282-00	ELECT	22MF 20% 25V	C213	1-136-161-00	FILM	0.047MF 5% 50V
C44	1-162-290-31	CERAMIC	470PF 10% 50V	C214	1-130-481-00	MYLAR	0.0068MF 5% 50V
C45	1-136-440-11	FILM	39PF 5% 630V	C215	1-136-153-00	FILM	0.01MF 5% 50V
C61	1-130-471-00	MYLAR	0.001MF 5% 50V	C216	1-124-252-00	ELECT	0.33MF 20% 50V
C62	1-136-157-00	FILM	0.022MF 5% 50V	C217	1-124-927-11	ELECT	4.7MF 20% 50V
C63	1-124-282-00	ELECT	22MF 20% 25V	C218	1-124-274-00	ELECT	4.7MF 20% 50V
C64	1-162-290-31	CERAMIC	470PF 10% 50V	C219	1-124-927-11	ELECT	4.7MF 20% 50V
C65	1-136-440-11	FILM	39PF 5% 630V	C220	1-136-161-00	FILM	0.047MF 5% 50V
C81	1-126-101-11	ELECT	100MF 20% 16V	C221	1-124-927-11	ELECT	4.7MF 20% 50V
C82	1-126-101-11	ELECT	100MF 20% 16V	C222	1-124-767-00	ELECT	2.2MF 20% 50V
C83	1-124-499-11	ELECT	1MF 20% 50V	C223	1-162-290-11	(AEP, UK)....CERAMIC	470PF 10% 50V
C84	1-124-925-11	ELECT	2.2MF 20% 50V	C301	1-123-875-11	ELECT	10MF 20% 50V
C85	1-130-279-91	FILM	0.0018MF 5% 100V	C302	1-123-875-11	ELECT	10MF 20% 50V
C86	1-130-275-91	FILM	0.0012MF 5% 100V	C303	1-123-382-00	ELECT	3.3MF 20% 50V
C87	1-130-275-91	FILM	0.0012MF 5% 100V	C304	1-124-443-00	ELECT	100MF 20% 10V
C88	1-136-557-91	FILM	0.0033MF 5% 630V	C305	1-123-875-11	ELECT	10MF 20% 50V
C101	1-124-499-11	ELECT	1MF 20% 50V	C306	1-123-875-11	ELECT	10MF 20% 50V
C102	1-162-292-31	CERAMIC	680PF 10% 50V	C307	1-123-875-11	ELECT	10MF 20% 50V
C103	1-124-499-11	ELECT	1MF 20% 50V	C501	1-124-556-11	ELECT	2200MF 20% 16V
C104	1-123-875-11	ELECT	10MF 20% 50V	C502	1-124-556-11	ELECT	2200MF 20% 16V
C105	1-161-375-00	CERAMIC	0.0022MF 30% 16V	C503	1-124-120-11	ELECT	220MF 20% 16V
C106	1-123-875-11	ELECT	10MF 20% 50V	C504	1-124-120-11	ELECT	220MF 20% 16V
C107	1-130-479-00	MYLAR	0.0047MF 5% 50V	C505	1-124-443-00	ELECT	100MF 20% 10V
C108	1-136-173-00	FILM	0.47MF 5% 50V	C506	1-124-472-11	ELECT	470MF 20% 10V
C109	1-136-167-00	FILM	0.15MF 5% 50V	C507	1-124-472-11	ELECT	470MF 20% 10V
C110	1-136-155-00	FILM	0.015MF 5% 50V	C508	1-126-101-11	ELECT	100MF 20% 16V
C111	1-136-169-00	FILM	0.22MF 5% 50V	C509	1-124-122-11	ELECT	100MF 20% 50V
C112	1-136-163-00	FILM	0.068MF 5% 50V	C510	1-124-925-11	ELECT	2.2MF 20% 50V
C113	1-136-161-00	FILM	0.047MF 5% 50V	C511	1-124-472-11	ELECT	470MF 20% 6.3V
C114	1-130-481-00	MYLAR	0.0068MF 5% 50V	C512	1-124-122-11	ELECT	100MF 20% 50V
C115	1-136-153-00	FILM	0.01MF 5% 50V	C513	1-123-875-11	ELECT	10MF 20% 50V
C116	1-124-252-00	ELECT	0.33MF 20% 50V	C514	1-123-875-11	ELECT	10MF 20% 50V
C117	1-124-927-11	ELECT	4.7MF 20% 50V	C515	1-124-444-00	ELECT	220MF 20% 6.3V
C118	1-124-274-00	ELECT	4.7MF 20% 50V	C516	1-124-443-00	ELECT	100MF 20% 10V
C119	1-124-927-11	ELECT	4.7MF 20% 50V	C517	1-161-494-00	CERAMIC	0.022MF 30% 25V
C120	1-136-161-00	FILM	0.047MF 5% 50V	C518	1-161-494-00	CERAMIC	0.022MF 30% 25V
C121	1-124-927-11	ELECT	4.7MF 20% 50V	C519	1-161-494-00	CERAMIC	0.022MF 30% 25V
C122	1-124-767-00	ELECT	2.2MF 20% 50V	C520	1-123-875-11	ELECT	10MF 20% 50V
C123	1-162-290-11	(AEP, UK)....CERAMIC	470PF 10% 50V	C522	1-162-219-11	(AEP, UK)....CERAMIC	68PF 5% 50V
C201	1-124-499-11	ELECT	1MF 20% 50V	C523	1-162-215-11	(AEP, UK)....CERAMIC	47PF 5% 50V
				CF501	1-567-771-11	VIBRATOR, CERAMIC (6.0MHz)	
				CF502	1-577-082-11	VIBRATOR, CERAMIC (4.0MHz)	

TC-RX50/RX50ES

Ref.No	Part No.	Description	Remark
CNJ501	1-559-684-11	CORD (WITH CONNECTOR) (SYNC)	
CNJ502	1-559-135-41	CORD (WITH CONNECTOR) (CONTROL S)	
CNP11	*1-564-499-11	PIN, CONNECTOR 6P	
CNP12	*1-564-339-61	PIN, CONNECTOR 5P	
CNP13	*1-564-707-11	PIN, CONNECTOR (SMALL TYPE) 5P	
CNP14	*1-564-704-11	PIN, CONNECTOR (SMALL TYPE) 2P	
CNP81	*1-564-709-11	PIN, CONNECTOR (SMALL TYPE) 7P	
CNP82	*1-564-339-51	PIN, CONNECTOR 5P	
CNP83	*1-564-338-51	PIN, CONNECTOR 4P	
CT42	1-141-391-11	CAP, ADJ	
CT62	1-141-391-11	CAP, ADJ	
D11	8-719-940-77	DIODE 1SS132T	
D81	8-719-940-77	DIODE 1SS132T	
D101	8-719-940-76	DIODE 1SS132	
D201	8-719-940-76	DIODE 1SS132	
D501	8-719-940-76	DIODE 1SS132	
D502	8-719-940-76	DIODE 1SS132	
D503	8-719-200-77	DIODE 10E2N	
D504	8-719-200-77	DIODE 10E2N	
D505	8-719-200-77	DIODE 10E2N	
D506	8-719-200-77	DIODE 10E2N	
D507	8-719-200-77	DIODE 10E2N	
D508	8-719-933-49	DIODE HZS7C1L	
D509	8-719-933-33	DIODE HZS6A1L	
D510	8-719-940-76	DIODE 1SS132	
D511	8-719-940-76	DIODE 1SS132	
D512	8-719-933-41	DIODE HZS6C3L	
D513	8-719-940-76	DIODE 1SS132	
D514	8-719-200-77	DIODE 10E2N	
D515	8-719-940-76	DIODE 1SS132T	
D516	8-719-940-76	DIODE 1SS132T	
D517	8-719-940-76	DIODE 1SS132T	
D518	8-719-200-77	DIODE 10E2N	
D519	8-719-303-74	DIODE SEL4214R	
D520	8-719-303-84	DIODE SEL4914D	
D521	8-719-303-79	DIODE SEL4414G	
D522	8-719-303-84	DIODE SEL4914D	
D523	8-719-303-84	DIODE SEL4914D	
D524	8-719-940-76	DIODE 1SS132	
D525	8-719-940-76	DIODE 1SS132	
D526	8-719-940-76	DIODE 1SS132	
D527	8-719-940-76	DIODE 1SS132	
D528	8-719-940-76	DIODE 1SS132	
D529	8-719-940-76	DIODE 1SS132	
D530	8-719-940-76	DIODE 1SS132	
D531	8-719-933-39	DIODE HZS6C1L	
FLT501	1-519-447-11	INDICATOR TUBE, FLUORESCENT	
IC81	8-759-111-44	IC UPC4570C-1	
IC301	8-759-600-02	IC M5218L	
IC302	8-752-018-70	IC CX20187	
IC303	8-759-600-02	IC M5218L	
IC304	8-759-600-02	IC M5218L	
IC305	8-752-032-60	IC CXA1198P	
IC501	8-759-971-73	IC MB88514B	
IC502	8-759-803-33	IC LC6528C-3175	
J301	1-507-797-21	JACK, LARGE TYPE (MICROPHONE)	
J302	1-507-796-21	JACK (HEADPHONES)	
J303	1-565-259-11	JACK, PIN 4P (LINE IN/OUT)	
L41	1-410-780-11	INDUCTOR 27MMH	
L61	1-410-780-11	INDUCTOR 27MMH	
LPF101	1-231-388-00	FILTER, LOW PASS	
LPF201	1-231-388-00	FILTER, LOW PASS	

Ref.No	Part No.	Description	Remark
M1	X-3343-408-1	MOTOR ASSY	
PM1	1-454-456-11	SOLENOID, PLUNGER	
PT501	△1-449-160-11	(US)....TRANSFORMER, POWER	
PT501	△1-449-161-11	(AEP, UK)....TRANSFORMER, POWER	
Q11	8-729-117-54	TRANSISTOR 2SA1175	
Q12	8-719-939-11	TRANSISTOR GP2509-B	
Q81	8-729-801-93	TRANSISTOR 2SD1387	
Q82	8-729-100-13	TRANSISTOR 2SC2001	
Q83	8-729-100-13	TRANSISTOR 2SC2001	
Q101	8-729-600-27	TRANSISTOR 2SC634SP	
Q102	8-729-600-27	TRANSISTOR 2SC634SP	
Q103	8-729-600-27	TRANSISTOR 2SC634SP	
Q104	8-729-900-80	TRANSISTOR DTC114ES	
Q105	8-729-900-80	TRANSISTOR DTC114ES	
Q201	8-729-600-27	TRANSISTOR 2SC634SP	
Q202	8-729-600-27	TRANSISTOR 2SC634SP	
Q203	8-729-600-27	TRANSISTOR 2SC634SP	
Q204	8-729-900-80	TRANSISTOR DTC114ES	
Q205	8-729-900-80	TRANSISTOR DTC114ES	
Q301	8-729-900-80	TRANSISTOR DTC114ES	
Q302	8-729-900-61	TRANSISTOR DTA114ES	
Q303	8-729-900-61	TRANSISTOR DTA114ES	
Q304	8-729-900-80	TRANSISTOR DTC114ES	
Q305	8-729-900-61	TRANSISTOR DTA114ES	
Q306	8-729-117-54	TRANSISTOR 2SA1175	
Q307	8-729-900-61	TRANSISTOR DTA114ES	
Q501	8-729-107-25	TRANSISTOR 2SD1585-M	
Q502	8-729-600-27	TRANSISTOR 2SC634SP	
Q503	8-729-600-27	TRANSISTOR 2SC634SP	
Q504	8-729-111-67	TRANSISTOR 2SB1094-L	
Q505	8-729-117-54	TRANSISTOR 2SA1175-HFE	
Q506	8-729-117-54	TRANSISTOR 2SA1175	
Q507	8-729-900-80	TRANSISTOR DTC114ES	
Q508	8-729-107-25	TRANSISTOR 2SD1585-M	
Q509	8-729-600-27	TRANSISTOR 2SC634SP	
Q510	8-729-117-54	TRANSISTOR 2SA1175	
Q511	8-729-140-	TRANSISTOR 2SB1116A-K-TP	
Q514	8-729-801-83	TRANSISTOR 2SB1013	
Q515	8-729-801-93	TRANSISTOR 2SD1387	
Q516	8-729-900-61	TRANSISTOR DTA114ES	
Q517	8-729-900-80	TRANSISTOR DTC114ES	
Q519	8-729-900-61	TRANSISTOR DTA114ES	
Q520	8-729-900-61	TRANSISTOR DTA114ES	
Q521	8-729-900-61	TRANSISTOR DTA114ES	
Q522	8-729-900-61	TRANSISTOR DTA114ES	
Q523	8-729-900-61	TRANSISTOR DTA114ES	
RESISTOR			
R11	1-247-834-11	CARBON 1.3K 5% 1/4W	
R12	1-249-414-11	CARBON 560 5% 1/4W	
R13	1-247-818-11	CARBON 300 5% 1/4W	
R14	1-249-408-11	CARBON 180 5% 1/4W	
R17	1-249-437-11	CARBON 47K 5% 1/4W	
R18	1-249-437-11	CARBON 47K 5% 1/4W	
R41	1-249-433-11	CARBON 22K 5% 1/4W	
R42	1-249-404-00	CARBON 82 5% 1/4W	
R43	1-247-885-00	CARBON 180K 5% 1/4W	
R44	1-249-426-11	CARBON 5.6K 5% 1/4W	
R45	1-249-428-11	CARBON 8.2K 5% 1/4W	
R61	1-249-433-11	CARBON 22K 5% 1/4W	
R62	1-249-404-00	CARBON 82 5% 1/4W	
R63	1-247-885-00	CARBON 180K 5% 1/4W	
R64	1-249-426-11	CARBON 5.6K 5% 1/4W	

Note: The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description				Remark	Ref.No	Part No.	Description				Remark
R65	1-249-428-11	CARBON	8.2K	5%	1/4W		R224	1-249-429-11	CARBON	10K	5%	1/4W	
R81	1-249-409-11	CARBON	220	5%	1/4W		R225	1-247-840-00	CARBON	2.4K	5%	1/4W	
R82	1-249-409-11	CARBON	220	5%	1/4W		R226	1-249-409-11	CARBON	220	5%	1/4W	
R83	1-249-429-11	CARBON	10K	5%	1/4W		R227	1-249-434-11	CARBON	27K	5%	1/4W	
R84	Δ 1-217-384-00	FUSIBLE	5.6	5%	1/4W	F	R228	1-249-434-11	CARBON	27K	5%	1/4W	
R85	1-249-436-11	CARBON	39K	5%	1/4W		R229	1-247-862-11	CARBON	20K	5%	1/4W	
R86	1-249-436-11	CARBON	39K	5%	1/4W		R230	1-249-397-11	CARBON	22	5%	1/4W	
R101	1-249-417-11	CARBON	1K	5%	1/4W		R231	1-249-418-11	CARBON	1.2K	5%	1/4W	
R102	1-249-435-11	CARBON	33K	5%	1/4W		R232	1-247-887-00	CARBON	220K	5%	1/4W	
R103	1-249-429-11	CARBON	10K	5%	1/4W		R233	1-249-419-11	CARBON	1.5K	5%	1/4W	
R104	1-249-411-11	CARBON	330	5%	1/4W		R234	1-249-412-11	CARBON	390	5%	1/4W	
R105	1-249-434-11	CARBON	27K	5%	1/4W		R235	1-249-417-11	CARBON	1K	5%	1/4W	
R106	1-249-437-11	CARBON	47K	5%	1/4W		R301	1-249-413-11	CARBON	470	5%	1/4W	
R107	1-249-417-11	CARBON	1K	5%	1/4W		R302	1-249-413-11	CARBON	470	5%	1/4W	
R108	1-249-417-11	CARBON	1K	5%	1/4W		R303	1-249-429-11	CARBON	10K	5%	1/4W	
R109	1-249-441-11	CARBON	100K	5%	1/4W		R304	1-215-469-00	METAL	100K	1%	1/6W	
R110	1-249-423-11	CARBON	3.3K	5%	1/4W		R305	1-249-425-11	CARBON	4.7K	5%	1/4W	
R111	1-249-427-11	CARBON	6.8K	5%	1/4W		R306	1-249-429-11	CARBON	10K	5%	1/4W	
R112	1-247-840-00	CARBON	2.4K	5%	1/4W		R307	1-249-425-11	CARBON	4.7K	5%	1/4W	
R113	1-249-425-11	CARBON	4.7K	5%	1/4W		R308	1-247-854-11	CARBON	9.1K	5%	1/4W	
R114	1-247-822-11	CARBON	430	5%	1/4W		R309	1-249-416-11	CARBON	820	5%	1/4W	
R115	1-249-427-11	CARBON	6.8K	5%	1/4W		R310	1-249-425-11	CARBON	4.7K	5%	1/4W	
R116	1-249-415-11	CARBON	680	5%	1/4W		R311	1-249-421-11	CARBON	2.2K	5%	1/4W	
R117	1-249-426-11	CARBON	5.6K	5%	1/4W		R312	1-247-864-11	CARBON	24K	5%	1/4W	
R118	1-249-421-11	CARBON	2.2K	5%	1/4W		R313	1-249-437-11	CARBON	47K	5%	1/4W	
R119	1-249-425-11	CARBON	4.7K	5%	1/4W		R315	1-247-876-11	CARBON	75K	5%	1/4W	
R120	1-249-433-11	CARBON	22K	5%	1/4W		R317	1-249-438-11	CARBON	56K	5%	1/4W	
R121	1-249-421-11	CARBON	2.2K	5%	1/4W		R318	1-249-435-11	CARBON	33K	5%	1/4W	
R122	1-249-417-11	CARBON	1K	5%	1/4W		R319	1-249-438-11	CARBON	56K	5%	1/4W	
R123	1-249-421-11	CARBON	2.2K	5%	1/4W		R320	1-247-876-11	CARBON	75K	5%	1/4W	
R124	1-249-429-11	CARBON	10K	5%	1/4W		R321	1-247-883-00	CARBON	150K	5%	1/4W	
R125	1-247-840-00	CARBON	2.4K	5%	1/4W		R322	1-247-887-11	CARBON	220K	5%	1/4W	
R126	1-249-409-11	CARBON	220	5%	1/4W		R323	1-249-435-11	CARBON	33K	5%	1/4W	
R127	1-249-434-11	CARBON	27K	5%	1/4W		R324	1-249-440-11	CARBON	82K	5%	1/4W	
R128	1-249-434-11	CARBON	27K	5%	1/4W		R325	1-247-882-00	CARBON	130K	5%	1/4W	
R129	1-247-862-11	CARBON	20K	5%	1/4W		R326	1-247-896-81	CARBON	510K	5%	1/4W	
R130	1-249-397-11	CARBON	22	5%	1/4W		R327	1-247-880-11	CARBON	110K	5%	1/4W	
R131	1-249-418-11	CARBON	1.2K	5%	1/4W		R328	1-247-887-11	CARBON	220K	5%	1/4W	
R132	1-247-887-00	CARBON	220K	5%	1/4W		R329	1-215-466-00	CARBON	75K	5%	1/4W	
R133	1-249-419-11	CARBON	1.5K	5%	1/4W		R330	1-249-438-11	CARBON	56K	5%	1/4W	
R134	1-249-412-11	CARBON	390	5%	1/4W		R501	1-249-421-11	CARBON	2.2K	5%	1/4W	
R135	1-249-417-11	CARBON	1K	5%	1/4W		R502	1-249-421-11	CARBON	2.2K	5%	1/4W	
R201	1-249-417-11	CARBON	1K	5%	1/4W		R503	1-249-421-11	CARBON	2.2K	5%	1/4W	
R202	1-249-435-11	CARBON	33K	5%	1/4W		R504	1-249-409-11	CARBON	220	5%	1/4W	
R203	1-249-429-11	CARBON	10K	5%	1/4W		R505	1-249-418-11	CARBON	1.2K	5%	1/4W	
R204	1-249-411-11	CARBON	330	5%	1/4W		R506	1-249-418-11	CARBON	1.2K	5%	1/4W	
R205	1-249-434-11	CARBON	27K	5%	1/4W		R507	1-249-421-11	CARBON	2.2K	5%	1/4W	
R206	1-249-437-11	CARBON	47K	5%	1/4W		R508	1-249-421-11	CARBON	2.2K	5%	1/4W	
R207	1-249-417-11	CARBON	1K	5%	1/4W		R509	1-249-417-11	CARBON	1K	5%	1/4W	
R208	1-249-417-11	CARBON	1K	5%	1/4W		R510	1-249-437-11	CARBON	47K	5%	1/4W	
R209	1-249-441-11	CARBON	100K	5%	1/4W		R511	1-249-405-11	CARBON	100	5%	1/4W	
R210	1-249-423-11	CARBON	3.3K	5%	1/4W		R512	1-249-421-11	CARBON	2.2K	5%	1/4W	
R211	1-249-427-11	CARBON	6.8K	5%	1/4W		R513	1-249-433-11	CARBON	22K	5%	1/4W	
R212	1-247-840-00	CARBON	2.4K	5%	1/4W		R514	1-249-432-11	CARBON	18K	5%	1/4W	
R213	1-249-425-11	CARBON	4.7K	5%	1/4W		R515	1-249-423-11	CARBON	3.3K	5%	1/4W	
R214	1-247-822-11	CARBON	430	5%	1/4W		R516	1-249-423-11	CARBON	3.3K	5%	1/4W	
R215	1-249-427-11	CARBON	6.8K	5%	1/4W		R517	1-249-433-11	CARBON	22K	5%	1/4W	
R216	1-249-415-11	CARBON	680	5%	1/4W		R518	1-249-421-11	CARBON	2.2K	5%	1/4W	
R217	1-249-426-11	CARBON	5.6K	5%	1/4W		R519	1-249-405-11	CARBON	100	5%	1/4W	
R218	1-249-421-11	CARBON	2.2K	5%	1/4W		R520	1-249-429-11	CARBON	10K	5%	1/4W	
R219	1-249-425-11	CARBON	4.7K	5%	1/4W		R521	1-249-393-11	CARBON	10	5%	1/4W	
R220	1-249-433-11	CARBON	22K	5%	1/4W		R524	1-249-417-11	CARBON	1K	5%	1/4W	
R221	1-249-421-11	CARBON	2.2K	5%	1/4W		R525	1-249-425-11	CARBON	4.7K	5%	1/4W	
R222	1-249-417-11	CARBON	1K	5%	1/4W		R526	1-249-417-11	CARBON	1K	5%	1/4W	
R223	1-249-421-11	CARBON	2.2K	5%	1/4W		R527	1-249-437-11	CARBON	47K	5%	1/4W	

Note: The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Remark		
R528	1-249-425-11	CARBON	4.7K	5%	1/4W
R529	1-249-425-11	CARBON	4.7K	5%	1/4W
R530	1-249-417-11	CARBON	1K	5%	1/4W
R531	1-249-425-11	CARBON	4.7K	5%	1/4W
R532	1-249-428-11	CARBON	8.2K	5%	1/4W
R533	1-249-424-11	CARBON	3.9K	5%	1/4W
R534	1-249-422-11	CARBON	2.7K	5%	1/4W
R535	1-249-422-11	CARBON	2.7K	5%	1/4W
R536	1-249-424-11	CARBON	3.9K	5%	1/4W
R537	1-249-428-11	CARBON	8.2K	5%	1/4W
R538	1-247-812-11	CARBON	160	5%	1/4W
R539	1-247-812-11	CARBON	160	5%	1/4W
R540	1-247-812-11	CARBON	160	5%	1/4W
R541	1-247-812-11	CARBON	160	5%	1/4W
R542	1-247-812-11	CARBON	160	5%	1/4W
R543	1-249-417-11	CARBON	1K	5%	1/4W
R544	1-247-862-11	CARBON	20K	5%	1/4W
R545	1-247-862-11	CARBON	20K	5%	1/4W
R546	1-249-417-11	CARBON	1K	5%	1/4W
R547	1-247-862-11	CARBON	20K	5%	1/4W
R548	1-249-429-11	CARBON	10K	5%	1/4W
R549	1-249-429-11	CARBON	10K	5%	1/4W
R550	1-247-862-11	CARBON	20K	5%	1/4W
R551	1-249-417-11	CARBON	1K	5%	1/4W
R552	1-249-429-11	CARBON	10K	5%	1/4W
R553	1-249-425-11	CARBON	4.7K	5%	1/4W
R554	1-249-429-11	CARBON	10K	5%	1/4W
R555	1-249-429-11	CARBON	10K	5%	1/4W
R556	1-249-425-11	CARBON	4.7K	5%	1/4W
RB501	1-233-140-11	COMPOSITION CIRCUIT BLOCK 100KX8			
RB502	1-233-141-11	COMPOSITION CIRCUIT BLOCK 100KX9			
RV41	1-228-989-00	RES, ADJ, CARBON 470			
RV61	1-228-989-00	RES, ADJ, CARBON 470			
RV101	1-228-994-00	RES, ADJ, CARBON 10K			
RV201	1-228-994-00	RES, ADJ, CARBON 10K			
RV301	1-238-097-11	RES, VAR, CARBON 20K/20K (REC LEVEL)			
RY81	1-515-614-11	RELAY			
S10	1-571-028-11	SWITCH, LEAF (DIRECTION)			
S11	1-571-281-21	SWITCH, LEAF (HALF)			
S12	1-571-281-21	SWITCH, LEAF (REC (A))			
S13	1-571-281-21	SWITCH, LEAF (REC (B))			
S501	1-554-303-21	SWITCH, KEY BOARD (● REC)			
S502	1-554-303-21	SWITCH, KEY BOARD (▶▶)			
S503	1-554-303-21	SWITCH, KEY BOARD (◀◀)			
S504	1-554-303-21	SWITCH, KEY BOARD (■)			
S505	1-554-303-21	SWITCH, KEY BOARD (II)			
S506	1-554-303-21	SWITCH, KEY BOARD (▶)			
S507	1-554-303-21	SWITCH, KEY BOARD (◀)			
S508	1-554-303-21	SWITCH, KEY BOARD (REC MUTE)			
S509	1-554-303-21	SWITCH, KEY BOARD (MEMORY)			
S510	1-554-303-21	SWITCH, KEY BOARD (RESET)			
S511	1-570-103-21	SWITCH, PUSH (1 KEY) (POWER)			
S512	1-554-423-00	SWITCH, SLIDE (TIMER)			
S513	1-571-369-11	SWITCH, PUSH (3 KEY) (DOLBY NR/DIRECTION MODE)			
S515	1-571-370-11	SWITCH, PUSH (3 KEY) (TAPE SELECT)			
SPK101	1-235-186-00	ENCAPSULATED COMPONENT			
SPK201	1-235-186-00	ENCAPSULATED COMPONENT			
T81	1-433-333-11	TRANSFORMER, BIAS OSCILLATION			
THP501	1-808-065-11	(AEP, UK)....THERMISTOR, POSITIVE			
THP502	1-808-065-11	(AEP, UK)....THERMISTOR, POSITIVE			

ACCESSORY & PACKING MATERIAL

Part No.	Description	Remark
1-558-233-11	CORD (WITH CONNECTOR)(SIRCS)4P	
1-559-533-11	CORD, CONNECTION	
*3-327-844-51	(AEP, UK)....INDIVIDUAL CARTON	
*3-327-844-61	(US)....INDIVIDUAL CARTON	
*3-332-555-01	(US, UK)....CUSHION	
*3-346-203-01	(AEP)....CUSHION	
3-701-630-00	BAG, POLYETHYLENE	
3-703-450-01	(US)....INSTRUCTION	
*3-704-343-01	SHEET (STANDARD), PROTECTION	
3-769-894-11	(AEP, UK)....MANUAL, INSTRUCTION	
3-769-894-21	(US)....MANUAL, INSTRUCTION	
3-769-894-41	(AEP)....MANUAL, INSTRUCTION	